

***Tuberolabium guamense***

A total of approximately 7,301 *Tuberolabium guamense* (TuGu) have been located during recent surveys on Department of Defense (DoD) lands. The numbers are based on the following:

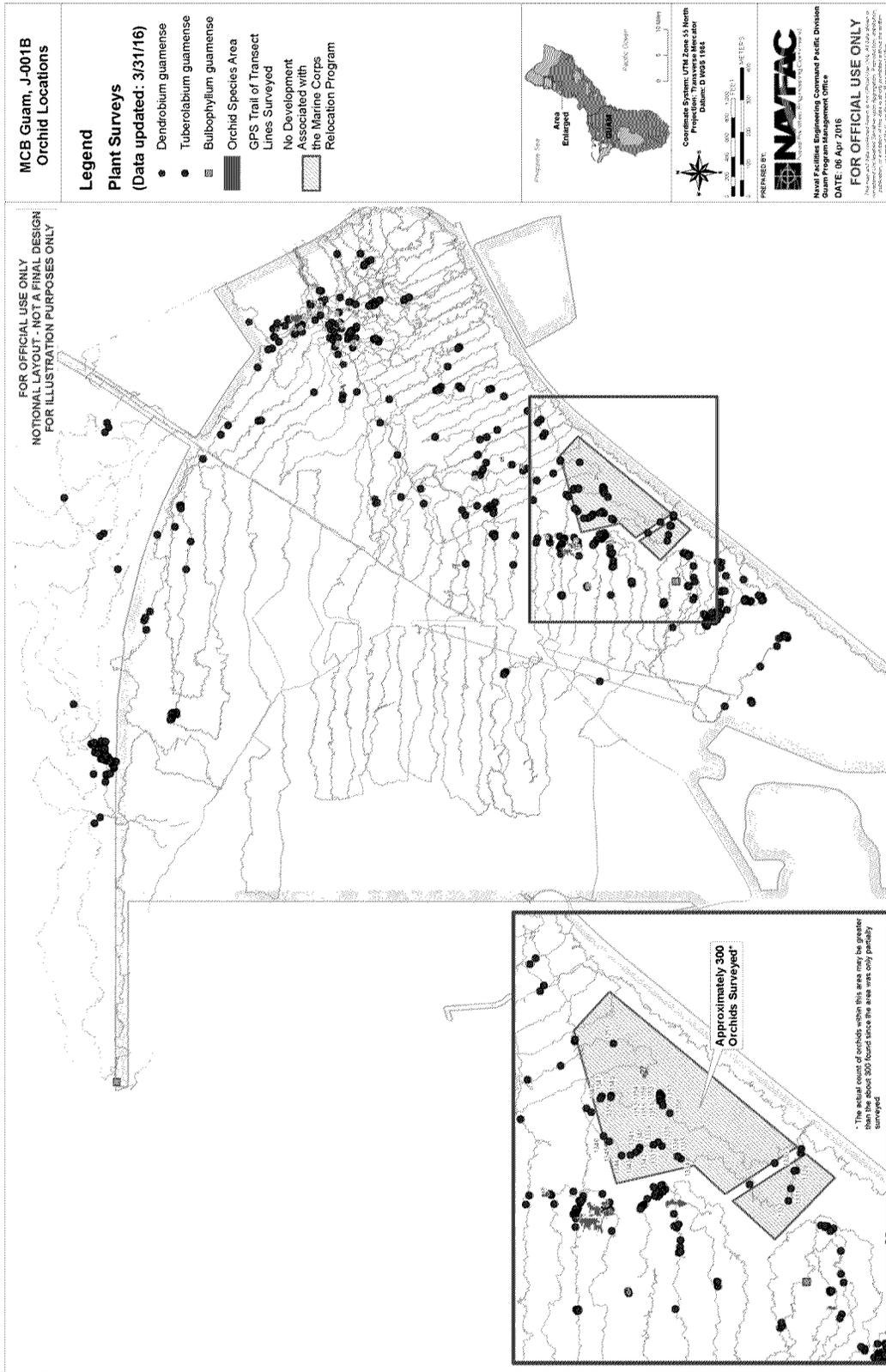
<b>Data Source</b>	<b>Location</b>	<b>Number of Individuals</b>
Final rule listing the species as threatened	Naval Munitions Site	1
University of Guam rare plant survey	HMU, Ritidian fence area and Mt. Alifan/Mt. Lamlam (251 at HMU, 105 at the Ritidian fence area and 188 at Mt. Alifan/Mt. Lamlam).	544
TuGu surveys conducted by DON biologists	Finegayan - outside the construction footprint; within forest enhancement area	1,370
DON high value tree surveys	Finegayan - outside the construction footprint	61
TuGu surveys conducted by DON biologists	Finegayan – within the construction footprint	270
DON high value tree surveys	Finegayan - within the construction footprint	5,055
<b>Total known population on DoD lands (as of 6 Apr 2016)</b>		<b>7,301</b>

We are able to avoid approximately 2,276 TuGu (31.2%) on DoD lands. This includes the plant within the Naval Munitions Site, the 544 plants found during the UoG rare plant surveys, 1,370 plants found within the forest enhancement area, 61 plants identified during the high value tree surveys, and 300 plants within the construction footprint. Figure 1 depicts the location of the 6,548 TuGu within the Finegayan area including the approximately 300 plants that can be avoided due to a known sinkhole in the area. Figure 1 does not depict the 98 plants found on April 5, 2016 and 110 plants found on April 7, 2016 on *Vitex* trees in the northeastern corner of the forest enhancement site in North Finegayan or the plants at the Naval Munitions Site, HMU, Ritidian fence area and Mt. Alifan/Mt. Lamlam.

Through the design phase, we will continue to evaluate the number of orchids that can be avoided, which will depend on their exact location with respect to the full site investigations, topographic surveys, geotechnical investigations, munitions of explosive concern (MEC) surveys, and clearing, grubbing and grading requirements in accordance with the final design. However, at this time, it is not reasonable to commit to avoiding the remaining 5,025 plants within the project footprint.

We believe our avoidance of approximately 31% of the total population on DoD lands coupled with our conservation measures to: (1) conduct contractor education to ensure construction contractor personnel are informed of the biological resources in the project area, including special-status species, avoidance measures, and reporting requirements; and (2) salvage healthy plants and either transplant them immediately into nearby habitat or forest enhancement sites or house them in a native plant nursery until a suitable site can be identified provides a suitable and appropriate minimization measure. We have developed a scope of work that includes the salvage of 2,000 TuGu and a performance standard of ensuring that a minimum of 50% survivorship of the TuGu which includes one year of maintenance and monitoring.

Figure 1.



## Mariana eight spot butterfly

In the area of the MPMG range, there are nine known occurrence locations of the Mariana eight spot butterfly (Figure 2). We are able to avoid three of the nine locations in the area, as they are outside of the construction footprint. The other six locations (depicted on Figure 2 as yellow “butterfly” points) are within the potential direct impact area of the MPMG range.

The six butterfly locations and the associated host plants (pink “H” points) were identified by HDR during focused survey conducted in October of 2011 (Threatened and Endangered Species and Migratory Birds Monitoring Report, HDR 2013). The survey area is referred to as R5 (Figure 3 below; Figure 5-7 from the report, included below). According to the map, one adult Mariana eight spot butterfly was observed, two of the *Elatostema* were occupied and one *Procris* was occupied. The remaining host plants were not occupied.

Figure 2 also depicts the results of the surveys conducted by the University of Guam in 2013 for the Mariana eight spot butterfly (Federal Candidate Species Surveys on Guam, UoG 2014). Table 5 from the UoG report (Occurrences of adult *Hypolimnys octocula marianensis* butterflies on DoD lands on Guam), they spotted one adult on tree in the area of the MPMG range on July 5, 2013. Table 6 from the report (Occurrences of *Hypolimnys* sp. chrysalides on DoD lands on Guam) identifies six points where 6 chrysalides of *H. octocula marianensis?* were found on *Procris pedunculata* and 3 incomplete and 1 smooth chrysalis of *H. octocula marianensis* were found on *Procris pedunculata* on April 2, 2013. Tables 5 and 6 and Figures 4 and 5 from the report are included below as figure.

This project is planned for fiscal year 2019 and until we have all the information on the confirmation of the exact location of the butterflies, full site investigations, topographic surveys, geotechnical investigations, MEC surveys, and development of the design to include the clearing, grubbing and grading requirements, we cannot determine the actual grades for the range and if the 25 ft (8 m) tall impact berm at the far end of the range can reasonably be constructed by omitting the 6 locations from the project footprint.

We would like to re-state that we have included extensive minimization and conservation measures for the protection of the Mariana eight spot butterfly to include:

1. Contractor education programs
2. Pre-construction butterfly and host plant surveys within suitable habitat within project boundaries.
3. Salvage host plant parts (not the entire plant) and provide them to an expert in the identification of the larvae or eggs of the Mariana eight spot butterfly for identification and propagation of Mariana eight spot butterflies.
4. Planting of the Mariana eight-spot host plants within the forest enhancement sites. The number of host plants that would be planted would be commensurate with the amount of host plants that are removed or developed over within the footprint of the LFTRC.

As stated in the final rule determining endangered status for the species, the Mariana eight-spot butterfly is dependent upon two relatively rare host plant species, both of which are susceptible to the effects of ungulate grazing. It is our understanding that the propagation of the host plants (*Procris*

*pedunculata* and *Elatostema calcareum*) has been successful and that coupled with our forest enhancement activities that include ungulate fencing and eradication within the approximately 1,000 acres at Finegayan and propagation of the butterflies by a species expert should provide a greater conservation benefit to the species than is being accomplished for the species to date, and fully minimizes the potential effects on the species from the military relocation.

In addition, the 5,234 acres that has been set aside for durable habitat protection to support native habitat restoration and land management for the survival and recovery of the Guam Micronesian kingfisher also provides a conservation benefit to the known populations of Mariana eight spot butterfly on DoD land (eg. Haputo and Tarague areas).



Figure 3.

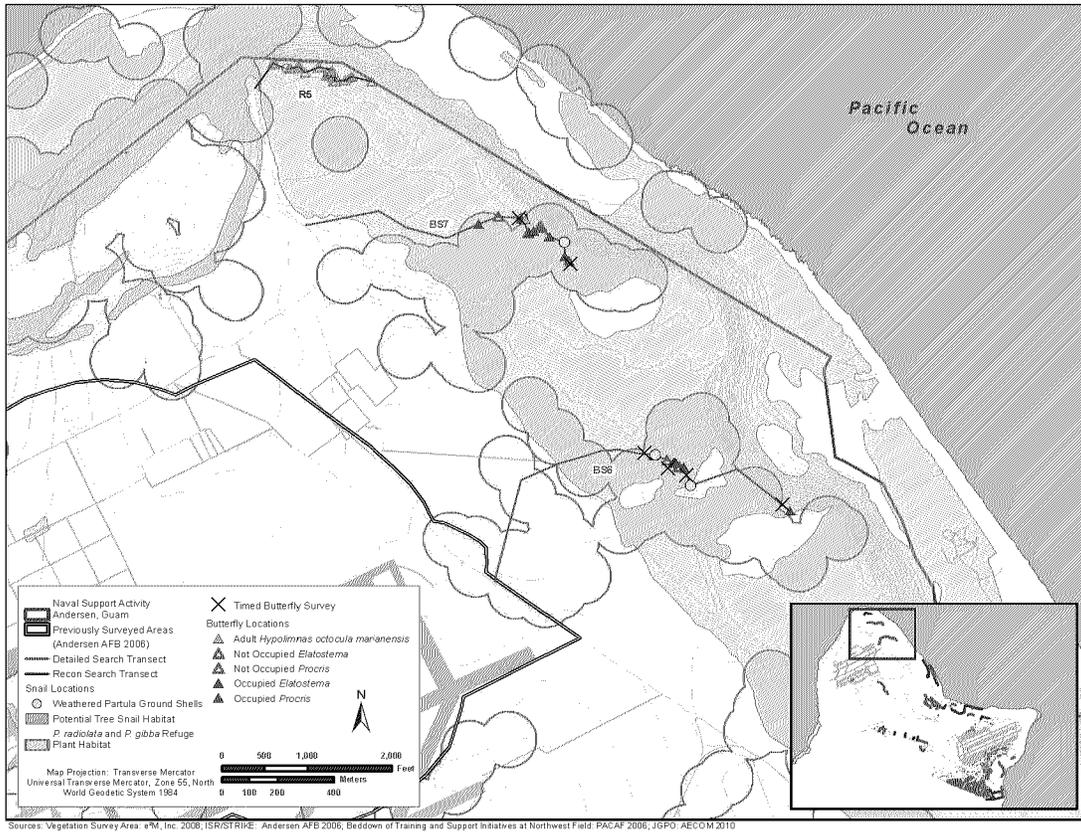


Figure 5-7. Detailed Map of Detailed Butterfly Search Transects BS6 and BS7.

Figure 4. The Transects Surveyed on Northwest Field (NW1-NW5)

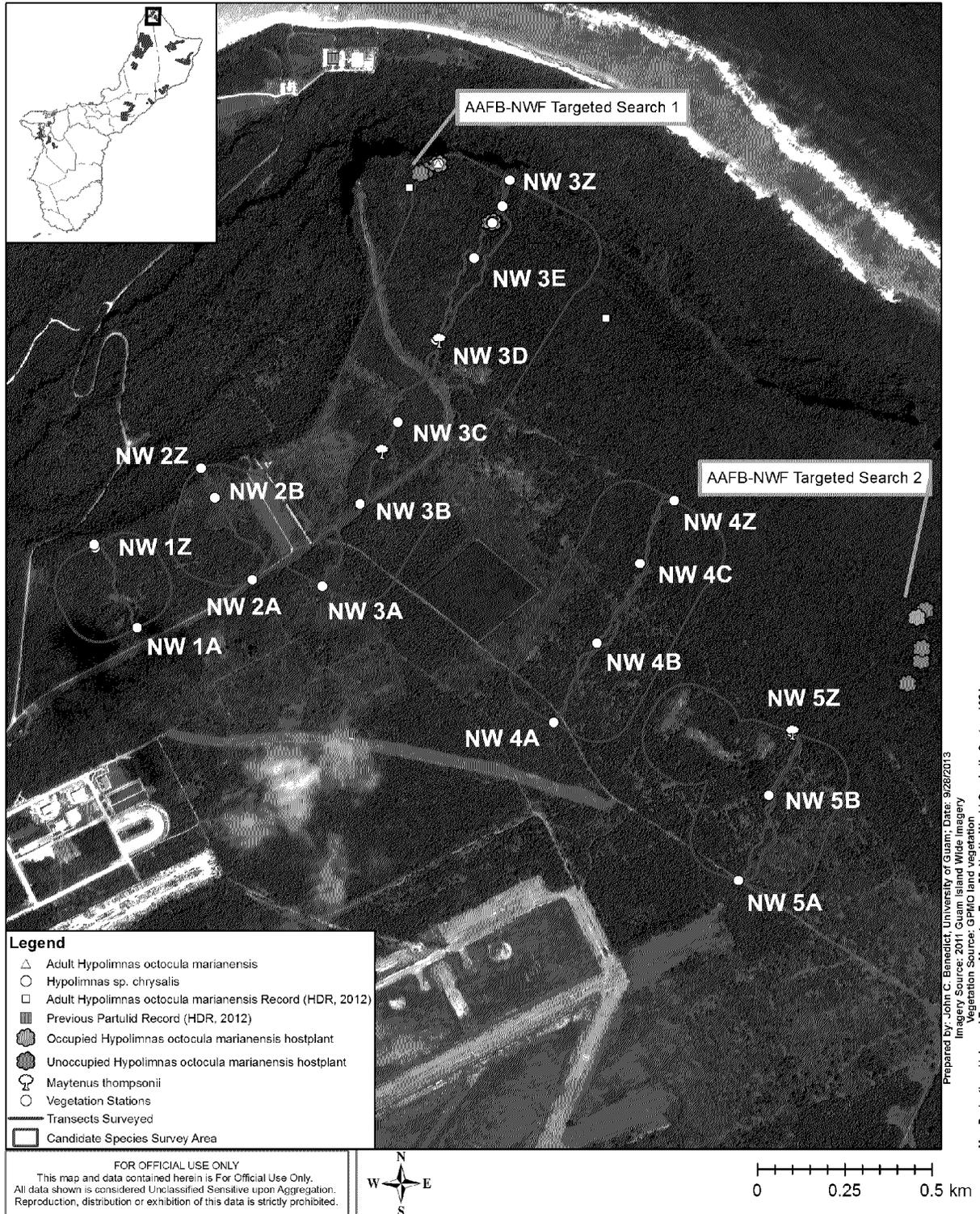


Figure 5. The Transects Surveyed on Northwest Field (NW1-NW5)

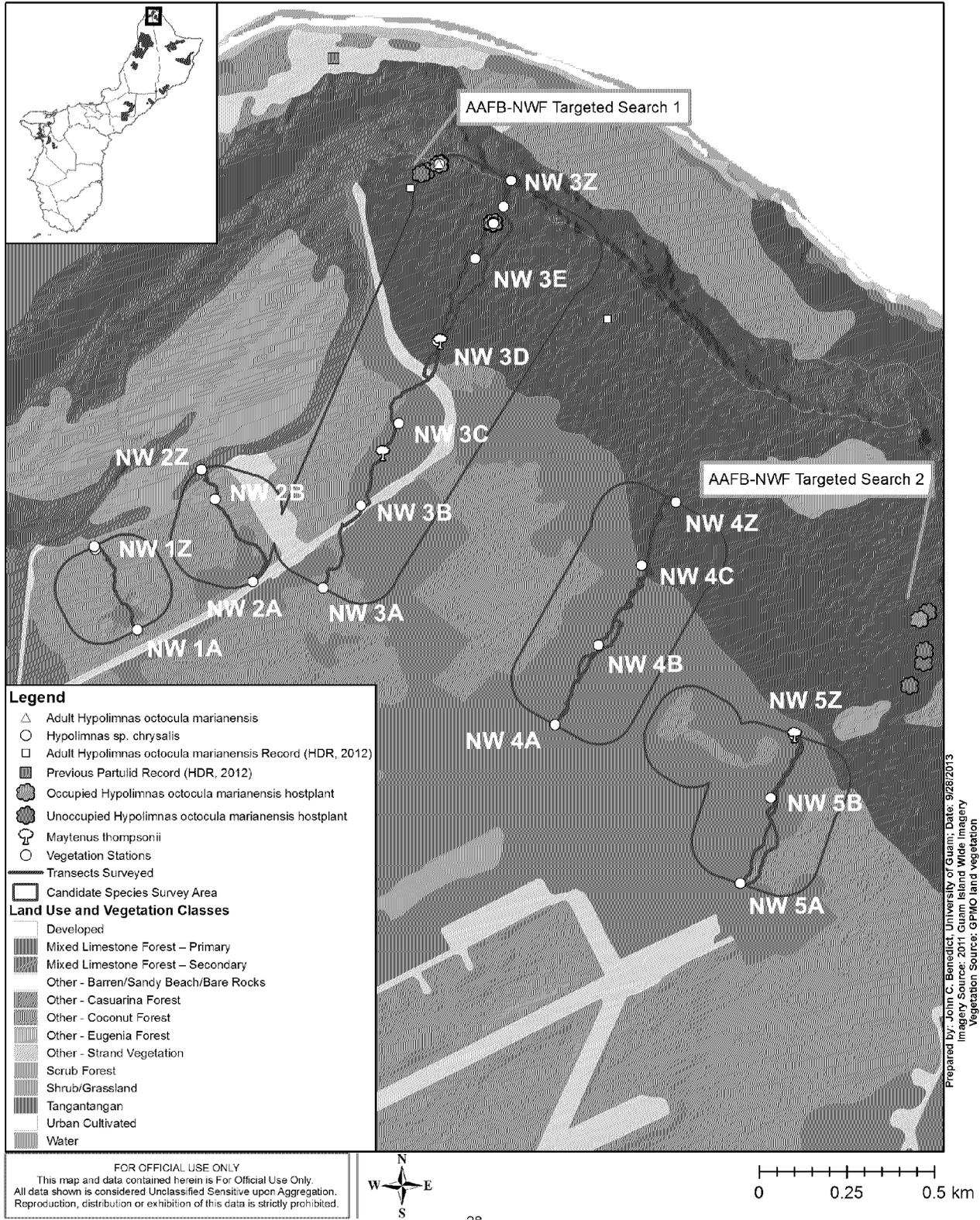


Table 5. Occurrences of *Hypolimnas* sp. chrysalides on DoD lands on Guam

Date	Area	Area Name	Candidate Species	Population Notes	Latitude (°N)	Longitude (°E)	Vegetation Class (FEIS July 2010)
3/25/13	RT 15	RT 4A to 4C	<i>H. octocula marianensis?</i>	1 chrysalis on <i>Maytenus thompsonii</i> , 1 in a spider web.	13.5103905	144.8915966	Shrub/Grassland
3/26/13	RT 15	RT 15 2A to 2B	<i>H. octocula marianensis?</i>	7 on <i>Procris pedunculata</i> , 1 on a fern, 1 on a <i>Ficus</i> root, and 1 on <i>Guamia marianae</i>	13.5002199	144.88582	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	1 chrysalis on <i>Procris pedunculata</i> .	13.5002019	144.8858159	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	1 chrysalis on <i>Procris pedunculata</i> .	13.5003412	144.8857493	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis?</i>	2 chrysalides on <i>Procris pedunculata</i>	13.6491983	144.865315	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis?</i>	4 chrysalides on <i>Procris pedunculata</i>	13.6495878	144.8655352	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	1 incomplete chrysalis on <i>Procris pedunculata</i> .	13.649204	144.8652765	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	1 incomplete chrysalis on <i>Procris pedunculata</i> .	13.6491867	144.8652487	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	1 incomplete chrysalis on <i>Procris pedunculata</i> .	13.6491732	144.8652526	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis?</i>	1 smooth chrysalis on <i>Procris pedunculata</i> .	13.6491656	144.8652784	Mixed Limestone Forest - Primary
7/1/13	AAFB	AA 1 to AA 4 Part 1	<i>H. octocula marianensis</i>	2 chrysalides on <i>Ficus</i> sp.; 1 chrysalis on a fern.	13.596664	144.919253	Mixed Limestone Forest - Primary
7/5/13	AAFB-NWF	NW 3 to NW 5 Part 1	<i>H. octocula marianensis?</i>	1 chrysalis present on <i>Eugenia</i> sp. chrysalis not collected; maybe chrysalis of <i>Euploea leucostictos</i> .	13.650654	144.863853	Mixed Limestone Forest - Primary
7/5/13	AAFB-NWF	NW 3 to NW 5 Part 1	<i>H. octocula marianensis</i>	3 chrysalides on <i>Ficus</i> sp.; maybe chrysalides of <i>Euploea leucostictos</i> .	13.650649	144.863883	Mixed Limestone Forest - Primary
7/8/13	RT 15	RT 5A to RT 3A	<i>H. octocula marianensis</i>	1 chrysalis on <i>Eugenia reinwardtiana</i> .	13.5004	144.885833	Mixed Limestone Forest - Primary
7/8/13	RT 15	RT 5A to RT 3A	<i>H. octocula marianensis</i>	2 chrysalides on <i>Guamia marianae</i> .	13.5004	144.885833	Mixed Limestone Forest - Primary

Table 6. Occurrences of occupied *Hypolimnas octocula marianensis* host plants on DoD lands on Guam

Date	Area	Area Name	Candidate Species	Population Notes	Latitude (°N)	Longitude (°E)	Vegetation Class (FEIS July 2010)
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	1 patch of <i>Procris pedunculata</i> , no butterfly presence.	13.50022174	144.8858355	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	3 light green eggs on <i>Procris pedunculata</i> .	13.5002416	144.8858057	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	1 black egg on <i>Procris pedunculata</i> .	13.50026507	144.8857285	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	1 black egg on <i>Procris pedunculata</i> .	13.50025728	144.8857812	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	3 black eggs on <i>Procris pedunculata</i> .	13.50022878	144.8857658	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	4 black eggs on <i>Procris pedunculata</i> .	13.50019558	144.8857848	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	1 light green egg on <i>Procris pedunculata</i> .	13.50019827	144.8858247	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	6 black eggs on <i>Procris pedunculata</i> .	13.50024888	144.8857597	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	4 light green eggs on <i>Procris pedunculata</i> .	13.50026598	144.8857938	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	2 black eggs on <i>Procris pedunculata</i> .	13.50031017	144.8857799	Mixed Limestone Forest - Primary
3/26/13	RT15	RT 15 2A	<i>H. octocula marianensis</i>	3 light green eggs and 4 black eggs on <i>Procris pedunculata</i> .	13.500353	144.8858656	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	7 black eggs on <i>Procris pedunculata</i> .	13.6491731	144.8652705	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	10 black eggs on <i>Procris pedunculata</i> .	13.64919808	144.8652877	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	1 large patch of <i>Procris pedunculata</i> .	13.64919833	144.8652506	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	1 light green eggs and 10 black eggs on <i>Procris pedunculata</i> .	13.6491845	144.8652786	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	17 black eggs on <i>Procris pedunculata</i> .	13.64917437	144.8652556	Mixed Limestone Forest - Primary

Date	Area	Area Name	Candidate Species	Population Notes	Latitude (°N)	Longitude (°E)	Vegetation Class (FEIS July 2010)
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	9 black eggs on <i>Procris pedunculata</i> .	13.64919137	144.8652362	Mixed Limestone Forest - Primary
4/2/13	AAFB-NWF	NW 3E to 3Z	<i>H. octocula marianensis</i>	1 white egg on <i>Procris pedunculata</i> .	13.64919758	144.8652754	Mixed Limestone Forest - Primary
7/1/13	AAFB	AA 1 to AA 4 Part 1	<i>H. octocula marianensis</i>	More than 40 eggs in 3 patches of <i>Elatostema calcareum</i> .	13.596664	144.919253	Mixed Limestone Forest - Primary
7/2/13	AAFB	AA 1 to AA 4 Part 2	<i>H. octocula marianensis</i>	6 eggs on <i>Elatostema calcareum</i>	13.595521	144.912724	Mixed Limestone Forest - Primary
7/2/13	AAFB	AA 1 to AA 4 Part 2	<i>H. octocula marianensis</i>	8 eggs on <i>Elatostema calcareum</i>	13.59548	144.912714	Mixed Limestone Forest - Primary
7/2/13	AAFB	AA 1 to AA 4 Part 2	<i>H. octocula marianensis</i>	7 eggs on 2 patches of <i>Elatostema calcareum</i> .	13.5955	144.912736	Mixed Limestone Forest - Primary
7/2/13	AAFB	AA 1 to AA 4 Part 2	<i>H. octocula marianensis</i>	3 eggs on <i>Elatostema calcareum</i>	13.596006	144.911474	Mixed Limestone Forest - Primary
7/2/13	AAFB	AA 1 to AA 4 Part 2	<i>H. octocula marianensis</i>	At least 2 eggs on <i>E. calcareum</i> , patch not fully accessible.	13.595917	144.911255	Mixed Limestone Forest - Primary
7/2/13	AAFB	AA 1 to AA 4 Part 2	<i>H. octocula marianensis</i>	26 eggs on <i>Elatostema calcareum</i> ; patch not fully accessible.	13.595961	144.910989	Mixed Limestone Forest - Primary
7/5/13	AAFB-NWF	NW 3 to NW 5 Part 1	<i>H. octocula marianensis</i>	At least 57 eggs on <i>Elatostema calcareum</i> ; patch not fully accessible.	13.650649	144.863883	Mixed Limestone Forest - Primary
7/8/13	RT 15	RT 5A to RT 3A	<i>H. octocula marianensis</i>	4 eggs on 1 patch of <i>Procris pedunculata</i> .	13.502392	144.886644	Mixed Limestone Forest - Primary
7/8/13	RT 15	RT 5A to RT 3A	<i>H. octocula marianensis</i>	2 eggs on 1 patch of <i>Elatostema calcareum</i> .	13.502349	144.886108	Mixed Limestone Forest - Primary
7/8/13	RT 15	RT 5A to RT 3A	<i>H. octocula marianensis</i>	24 eggs on 1 patch of <i>Procris pedunculata</i> .	13.50229	144.886243	Mixed Limestone Forest - Primary